WHAT IS CLAIMED IS:

1. An apparatus, comprising:

at least one radiation source configured to provide N ($N \geq 2$) independent illuminant sources characterized by M ($M \geq 2$) wavelength channels in a predetermined wavelength range;

a sensor unit including at least one optical sensor, the sensor unit configured to be in optical communication with the at least one radiation source and a sample;

a memory storing an illuminant characterization matrix having spectral characteristics of the N illuminant sources in the M wavelength channels; and

a processor in communication with the sensor unit and the memory, the processor configured to provide spectral responses of the sample in the M wavelength channels based at least in part on the illuminant characterization matrix.

2. The apparatus of claim 1 wherein the memory further comprises calibration data associated with a substantially white sample in the predetermined wavelength range, the processor configured to provide spectral responses of the sample in the M wavelength channels based at least in part on the illuminant characterization matrix and the calibration data.

3. The apparatus of claim 1 wherein the spectral responses of the sample include reflectance values of the sample in the M wavelength channels.

4. The apparatus of claim 1 wherein the spectral responses of the sample include transmittance values of the sample in the M wavelength channels.

5. The apparatus of claim 1 wherein M equals to N.

6. The apparatus of claim 1 wherein the memory further comprises program code for performing a calibration associated with at least one calibration sample in the predetermined wavelength range.

7. The apparatus of claim 1 wherein the at least one radiation source include at least one light emitting diode (LED).

8. The apparatus of claim 1 wherein the sensor unit includes at least one photodiode.

9. The apparatus of claim 1 wherein the sensor unit includes a Charge-Coupled Device (CCD) array.

10. The apparatus of claim 1 wherein the processor is further configured to cause a presentation associated with the spectral responses of the sample to be displayed on a display panel.

11. The apparatus of claim 1 further comprising at least one user-interface element.

12. The apparatus of claim 1 further comprising a data transfer means in communication with the processor.

13. An apparatus, comprising:

a sample;

at least one radiation source configured to provide N ($N \geq 2$) independent illuminant sources characterized by M ($M \geq 2$) wavelength channels in a predetermined wavelength range;

a sensor unit including at least one optical sensor, configured to be in optical communication with the radiation sources and the sample;

a memory, storing an illuminant characterization matrix having spectral characteristics of the N illuminant sources in ~~the~~ M wavelength channels; and

a processor in communication with the sensor unit and the memory, configured to provide spectral responses of the sample in the M wavelength channels, based at least in part on the illuminant characterization matrix.

14. The apparatus of claim 13 wherein the memory further comprises calibration data associated with a substantially white sample in the predetermined wavelength range, the

processor configured to provide spectral responses of the sample in the *M* wavelength channels based at least in part on the matrix and the calibration data.

15. The apparatus of claim 14 wherein the memory further comprises calibration data associated with a substantially black sample, the processor configured to provide spectral responses of the sample in the *M* wavelength channels based at least in part on the matrix, the calibration data associated with the substantially white sample, and the calibration data associated with the substantially black sample.

16. The apparatus of claim 13 the spectral responses of the sample include reflectance values of the sample in the *M* wavelength channels.

17. The apparatus of claim 13 wherein the spectral responses of the sample include transmittance values of the sample in the *M* wavelength channels.

18. The apparatus of claim 13 wherein the memory further comprises program code for performing a calibration associated with at least one calibration sample in the predetermined wavelength range.

19. The apparatus of claim 13 further comprising a reference table containing spectral responses of a plurality of reference samples and color characteristics associated with the reference samples.

20. The apparatus of claim 19 wherein the processor is configured to provide color characteristics of the sample, based at least in part on the spectral responses of the sample and the reference table according to a predetermined scheme.

21. The apparatus of claim 13 wherein the at least one radiation source includes at least one light emitting diode (LED).

22. The apparatus of claim 13 wherein the processor is further configured to cause a presentation associated with the spectral responses of the sample to be displayed on a display panel.

23. The apparatus of claim 13 further comprising at least one user-interface element.

24. The apparatus of claim 13 wherein the memory further comprises at least one standard data table for color coordinates determination.

25. The apparatus of claim 24 wherein the processor is further configured to provide standard color coordinates of the sample.

26. The apparatus of claim 13 further comprising a data transfer means, in communication with the processor.

27. A method, comprising:

configuring at least one radiation source to provide N ($N \geq 2$) independent illuminant sources characterized by M ($M \geq 2$) wavelength channels in a predetermined wavelength range;

providing a sensor unit including at least one optical sensor, the sensor unit configured to be in optical communication with the radiation sources and a sample;

storing in a memory an illuminant characterization matrix having spectral characteristics of the N illuminant sources in the M wavelength channels; and

providing a processor in communication with the sensor unit and the memory, the processor configured to provide spectral responses of the sample in the M wavelength channels, based at least in part on the illuminant characterization matrix.

28. The method of claim 27 further comprising storing in the memory calibration data associated with a substantially white sample in the predetermined wavelength range, the processor configured to provide spectral responses of the sample in the M wavelength channels based at least in part on the illuminant characterization matrix and the calibration data.

29. The method of claim 27 further comprising providing a display panel in communication with the processor.

30. The method of claim 27 further comprising providing at least one user-interface element.